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ABSTRACT

The best learning occurs with a variety of learning experiences; it has been said that we retain 10% of what we see, 20% of what we hear, 50% of what we see and hear, and 80% of what we see, hear and do. Learning to make sense of the senses that the arts address (seeing, hearing, feeling) requires the development of special perceptual skills. Three major obstacles to a more lasting student learning experience include: (1) antiquated teaching strategies; (2) student learning habits which are ineffective for long-term retention; and (3) misplaced and incomplete educational goals. In this paper, a humanities teacher at Brigham Young University discusses the ramifications of these three problems and then demonstrates how his university is using newly available communications technology to address them. The author emphasizes the need to use media to improve student involvement, retention, and creativity and to bring teaching/learning about the arts into the 21st century. (Contains 14 references.) (AEF)

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Learning that Lasts: Using Interactive Multimedia Technology to Teach the Arts

Jon D. Green, Humanities (Brigham Young University)

Introduction

About fifteen years ago I underwent what you might call a "professional crisis" as a teacher. Sitting in my office after a spring term teaching a large class of humanities students, I began wondering how much of what I had taught them would stick. The more I thought about it, the more distressed I became. It gradually dawned on me that they would remember very little, because I realized that I had remembered virtually nothing from the classes I had taken at the university many years ago. I began seriously to question the whole teaching endeavor, spending enormous sums of money and expending years of toil in pursuit of "an impossible dream." What savvy businessman would ever risk investing in a venture with no tangible results, for education implies both the retention of information and the development of usable skills in the world's work. Neither seemed to be the fruits of my own experience or that of my students. Nevertheless, upon more careful reflection, I realized that my four years at the university were not entirely wasted. I learned how to think rationally and to write and research as an academic. I was exposed to the ideas of some supremely gifted thinkers and creators. I developed a broader view of the possibilities open to a human being who wants to learn and serve. And yet, in comparison with what I was served up during those four years, I retained very little. The sense of irrevocable loss was a burden that made me question the value of the educational experience we offer to students in American higher education.

What was striking about my own educational scorecard was not *what* I remembered, but *why* I remembered it. A religion course called "Your Religious Problems" required each student to outline and present a personal problem and get written feed-back from the teacher and all the students. I don't remember what the other students' problems were, but I remember mine, because I had to write it down and present it in class. A philosophy class required the students to formulate their *own* philosophy in terms of ethics, epistemology, logic, aesthetics, and metaphysics. It was a revelation to me that philosophy involved me in a deeply personal way, that I even *had* a personal philosophy. These remembered moments from my own education are convincing evidence that what I retained over the years were the indelible experiences I was directly involved with, while the information I read or was told in class evaporated into the wind like disappearing ink.

It is common knowledge that the best learning occurs with a variety of learning experiences. It has been said that we retain 10% of what we see, 20% of what we hear, 50% of what we see and hear, and *80%* of what we see, hear and *do*. This simple statistic became the heart of my new agenda in rethinking the way I taught the arts. I resolved to make my teaching more media-intensive and to find ways to make my students' learning more challenging, fun, and, above all, lasting. Given the enormous emotional impact the arts exert on the human psyche, the arts provide an ideal platform for experimenting with experiential learning, because they elicit both intellectual understanding and emotional responses. Learning to make sense of the senses that the arts address (seeing, hearing, feeling) requires the development of special perceptual skills that enlarge the embrace of what we normally define rather narrowly as IQs and GPAs.

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Three Major Pedagogical Problems

I see three major roadblocks to a more lasting learning experience for our students: (1) Our teaching strategies are antiquated; (2) The students' learning habits are mostly ineffective for long-term retention; and (3) Our educational goals are misplaced and incomplete. I will briefly address the ramifications of these three problems and then demonstrate some of the ways we at Brigham Young University are using newly available communications technology to address them.

1. Antiquated Teaching Strategies

Whether a teacher thinks of a student's mind as a muscle to be exercised, a garden to be cultivated, or an empty vessel to be filled greatly determines the appropriate teaching strategy. The explosion of information and the proliferation of large undergraduate classes have contributed to the widespread use of the lecture approach, which manifests itself in the typical scenario of a student sitting in a large class taking notes as a professor pontificates on his specialty. Students' learning difficulties in this situation are greatly exacerbated by their having grown up more familiar with a television screen than with the printed page. As a consequence, this kind of passive learning can be deadly boring for them and even if a student takes good notes and successfully learns the material to pass the exams, the knowledge gained is transitory and, therefore, useless.

This woodcut illustration [see attached] of a lecture given at a German university in the 14th century shows the professor seated on an elevated lectern reading from his notes to four rows of students, some of whom are attending to the lecture or taking notes, while others are in the act of daydreaming or talking to each other. One is asleep. If we could compare this picture to a photograph of a contemporary college classroom, what would be different? Virtually nothing but the attire and the presence of a chalkboard. In spite of the explosion of communications technology in this century, most students still learn as their pre-print ancestors did, by listening to lectures, taking notes, and passing tests. And most teachers still act as if the students had no books to read: they still teach primarily by lecturing to their note-taking students and test by measuring the students' capacity to memorize information for periodic regurgitation. I call this the "pre-print mentality." In fact, having to memorize large chunks of information in order to "pass the exam" represents a dinosaur relic from the pre-writing mentality. We haven't come very far in six centuries or even six millennia. Learning is still laboriously slow, often deadly boring, and governed primarily by the linear logic of a lecturing authority. We somehow can't bring ourselves to believe that a picture is worth a thousand words. How many words is a moving picture worth? How many words is a moving picture supplemented by a carefully crafted interactive computer format worth?

In terms of dollars, here is a telling example: In 1990, approximately 38 million Americans watched Ken Burns' superb PBS special, *The Civil War*, 11 hours of photos, music, letters, conversation, and narration. It cost $3 million, which works out to less than one cent an hour per viewer-learner. According to Lewis J. Perelman in his book, *School's Out*, "Had Burns wanted to convey the same subject matter to the same number of people through the hoary technology of the college lecture hall, the project would have cost something over $6 billion and would have required the full-time classroom efforts of all the history professors in America for at least a year or two."[1] It's time we took a closer look at what technology can do to bring our

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teaching and learning about the arts into creative contact with twentieth-century technological advances. Indeed, George Gilder has recently predicted that "Broadcasting hierarchies will [soon] give way to computer hierarchies [because] television technology is essentially centralized--a tool of tyrants--[while] computer technology amplifies both the intelligence of its owners and their power to choose and create."[2]

For learning to be engaging on the front end and lasting on the back end, it must be passionate, it must be experienced. To guarantee that my students would never have to question my own passion for the humanities, nor wonder whether it was worth their effort to understand, I begin each semester with a first-day, media-intensive "Sneak Preview." I simply line up my favorite video clips of painting, architecture, ballet, opera, music, drama, and film and "blow them away" with stunning moments of high intensity. Wouldn't you think twice about your initial dislike of opera if you saw Luciano Pavarotti belt out a high B natural in Puccini's aria, "Nessun Dorma?"

Another simple but effective way I have found to bring the heart into contact with the mind in the study of a great artist, is to link music familiar to them with visuals unfamiliar to them. When, at the end of the semester I ask my students to recall some of their most memorable moments in the class, they invariably say something like: "That day you talked about van Gogh!" And then I know what they mean. I used to pull slides that related to the lyrics of Don McLean's popular song, "Vincent," and show them while the music was playing. But at the beginning of fall semester last year I took a Quickstart seminar offered by the Instructional Technology Center to learn how to work with a software presentation program called *Adobe Premiere*. After three or four days of training I transferred my clunky slide/sound presentation onto a videotape with smooth dissolves between the visuals. This four-minute presentation gives them a holistic sense of van Gogh's appeal as an artist and human being. Thus, media-enhanced instruction provides the students with an immediate experience with the material that can then serve as a springboard to lively class discussion on their personal reactions, its applicability to the subject, and an occasion for further exploration, not to mention, a compelling reason to write.

2. Ineffective Learning Habits

American undergraduate education (K through 12) has consistently emphasized the importance of the three "R's," all of which engage only the rational faculties while excluding what we might call the fourth "R", the "aRts." As a result of the single-minded attention to the reason (verbal and math skills), college curricula have been reduced to exercises in mostly passive learning that often barely get beyond training in simple memory skills. Similarly, graduate education has focussed its energies almost exclusively on training the mind in the higher skills of logic and research. Some general education classes in college expose students to the arts, but they usually emphasize the historical context rather than helping them develop more applicable interpretive and critical skills that can be repeatedly applied in real life experiences (reading books, attending plays, going to the movies or even watching television). Given the enormous emotional power that the arts exert on the human psyche, it seems strange that school curricula place arts education on the sidelines. This wasn't always the case. In spite of his distrust of the arts, Plato viewed music as a more potent teaching instrument than any other, "because rhythm and harmony find their way into the inward places of the soul. . . making the soul of him who is

rightly educated graceful, or of him who is ill-educated ungraceful."[3] Plato's educational claim for the value of musical training reveals what history missed in transferring the Greek heritage to our generation. We got reason, but the holistic nature of Greek educational practices somehow got lost in the shuffle. We need to rediscover their belief in the interconnectedness of all knowledge and the importance of re-integrating the values of the Good, the True, and the Beautiful into the curricula of our schools.

One of the great scientists of the 19th century, Charles Darwin, recognized, perhaps too late in life, an irrevocable personal loss from overspecialization and the consequences of an exclusively rationalist method of education and a calculated neglect of arts education. Late in life in a letter to his son, Francis, he wrote:

> Poetry of many kinds . . . gave me great pleasure, and even as a schoolboy I took intense delight in Shakespeare, especially in the historical plays. I have also said that formerly pictures gave me considerable, and music very great, delight. But now for many years I cannot endure to read a line of poetry: I have tried lately to read Shakespeare and found it so intolerably dull that it nauseated me. I have also lost almost any taste for music. . . . My mind seems to have become a kind of machine for grinding general laws out of large collections of fact, but why this should have caused the atrophy of that part of the brain alone, on which the higher tastes depend, I cannot conceive. . . . The loss of these tastes is a loss of happiness, and may possibly be injurious to the intellect, and more probably to the moral character, by enfeebling the emotional part of our nature.[4]

The arts serve to nurture these "higher tastes" by engaging us directly in highly sensory experiences, which are not easily re-configured to fit the sequential order of logic. This is probably why it is so difficult to put emotions into words. They often defy reason because they are not logical: "Love is blind." However, being irrational does not mean such experiences are not meaningful or important. The "dissective" thrust of modern science relies on analysis, which requires the dispersal of parts that can be catalogued and classified. Unfortunately, the dissection process often kills the thing being studied. On the other hand, the "synthetic" thrust of sensory-intensive experiences with the arts requires what Samuel Taylor Coleridge called "poetic faith," that "willing suspension of disbelief,"[5] the engagement of intuition and emotion. With our "either-or" mentality, scientists dismiss experiences with the arts as inconsequential because they are unmeasurable and non-objective; and artists view scientific knowledge as disassociated and abstracted from the reality of human experience. What we need is a "both-and" mentality, an approach that encourages a blend of both deeply human needs: to make sense of the world and to sense the world more directly. This is where media-enhanced education comes in.

The large size of most of undergraduate classes makes it virtually impossible to prepare the students adequately for the kinds of skills learning that characterizes the sounder education we envision. I can greatly expand my tutoring capacities by multiplying myself through an interactive computer tutorial. With the willing and able support of the university's Humanities Research Center staff I have developed computer tutorials for all the major fine arts. Students go to the lab to learn how to recognize ballet steps, film techniques, the elements of music, and the styles of painting and architecture. The computer does a much better job than I could do even if I were available, for we have only recently discovered the remarkable patience of a

machine to tutor the ignorant: for slow students, a computer can repeat a sequence interminably, or wait for an answer until the cows come home; for fast students, a computer enables them to proceed at sometimes breakneck speed without breaking their necks. No more waiting for the lowest common denominator to catch up, a condition that makes many classes deadly boring for the bright students. In a way, we can reverse the traditional student-teacher ratio: instead of having one authority teaching 300 students, we can now have 300 authorities waiting in the wings to teach one student.

3. Inadequate Educational Objectives

The belief that intelligence is measurable, that each person has a numerical IQ, originated with Alfred Binet's attempts to create an "intelligence test" almost a century ago (1900). Since that time, virtually all school systems have bought into the belief that intelligence is a single entity that can be measured by a single paper-and-pencil instrument.

Paradoxically, the stunning success of rationalism in the West since the Renaissance has created a technology-driven media complex that is undermining the very legitimacy of linear logic in favor of a new spatial learning paradigm, whereby ready access to new knowledge is not governed by the sequence of words on a page, but by the learner's choice of icons on a computer screen. Reasoned arguments that carefully follow the stepping stones of linear logic are gradually succumbing to the arbitrary accessibility of "sound bites" and so-called "visuals" on television. It's as though we are being "fed" the conclusions in capsulated visual form without ever having learned the arguments that led up to the conclusions. The thought patterns typical of students, the recent products of our educational institutions, embody this topsy-turvy process: they are pretty good at giving answers, but not very good at giving reasons.

This is not surprising, for most students learn about a discipline from a textbook, which is already a distilled (distorted?) amalgam of loosely connected information on a subject, and are tested by means of disconnected paper and pencil exams. What textbooks convey, according to Athanasios Moulakis, is "a knowledge of what has been authoritatively said, not a familiarity with the way of thinking that gave rise to what was said."[6] As early as 1967, Heidegger wondered "whether thinking too will end in the business of information processing."[7] Sadly, Moulakis reasons, the triumphant march of technology has left us speechless, because this knowledge is becoming inexpressible in words--it is embedded in "mathematic notation" which has become increasingly divorced from the world of everyday experience. In fact, the proliferation of these new symbolic languages makes scientific knowledge not only incommunicable to the common man, but impedes communication within technical culture itself.[8] It seems we are faced with a strange new paradox: new knowledge is increasing at an accelerating pace, while the means by which it is communicated are becoming more and more indecipherable and disconnected from real human experience. We are experiencing a mental log-jam of monumental proportions. What is to be done?

One of the most promising recent developments in education is the pursuit of a wider definition of intelligence than standardized testing allows. According to Howard Gardner, there are at least *seven* different intelligences that he asserts "have equal claim to priority":[9] in addition to the traditional measures of intelligence such as verbal/linguistic and logical/mathematical, he identifies other intelligences such as musical/rhythmic, bodily/kinesthetic, visual/spatial,

interpersonal, and intrapersonal. In this view, intelligence is not mere mental recall, but "the ability to solve problems, or to fashion products, that are valued in one or more cultural or community settings".[10] Thus, a critical ingredient in retaining what we learn is developing perceptual skills that can be used repeatedly in different contexts for the rest of one's life, rather than relying on what Gardner refers to as the "decontextualized facility" of standardized testing procedures.

There are also serious flaws in our testing and grading procedures on all levels of education that computer technology can help to rectify. Wallace and Graves, in their recent book, *Poisoned Apple*, about the "Bell-Curve Crisis," decry the fact that "the system's fixation on the average has created an evaluation system that judges students more on how they compare to the average than on what they know" (19). Richard J. Stiggins, director of the Assessment Training Institute in Portland, Oregon, adds a further indictment: "The primary aim of grades in this [norm-referenced] system is not to gauge learning but to sort students."[11] While student achievement has remained static over the last decade, grade averages continue to climb. Since teachers are reluctant to relegate their students to failure, they lower their standards. However, I have never been concerned with grade inflation, because my goal is to help all of my students get As. This has never happened, but that is my goal. And now that I can allow them not only to practice their perceptual skills until they're perfect (much like learning how to play a piano), the personnel in our Humanities Research Center have helped me put my multi-media tests on the computer where the students have the option of taking an exam more than once. We are also collaborating with a local software company to develop a battery of different kinds of testing procedures that will allow a student to take an exam until a certain mastery level is reached, say 80%, at which point the student can proceed to the next level of learning. In my own field of arts education, one of the most exciting and promising avenues of skill development available through CD-ROM technology lies in what I would call "creative manipulation." Once students learn the vocabulary of a medium, and can recognize techniques and procedures, they can begin to explore the creative dimension of an art by choreographing a dance sequence, designing a building, or editing a film sequence on the screen.

The Proof is in the Pudding

For years we have been told by media moguls that by introducing computers into the schools, we can empower students with a control of the learning process unimaginable even a decade ago. George Gilder has written: "These technologies will give to every person at a work station the creative power of a factory tycoon of the industrial era [and] the communications power of a broadcast tycoon of the television age."[12] Notwithstanding the hype and hope for electronic education, however, we are still far from the promised land. The proof simply has not kept pace with the promise, as anyone knows who walks around campus and sticks his head into any classroom. It's all still business as usual. Richard White, technology administrator for Chicago's schools, said it best: "Teachers will have to get as comfortable with computers as blackboards, or it all will be a waste of money."[13] The best way to begin is simply to jump in and use the media to improve student involvement, retention, and creativity. It is high time we took a closer look at what technology can do to bring our teaching-learning about the arts into creative contact with twentieth-century technological advances. With focussed action we can develop what Howard Gardner defines as "a possible school of the future."[14] In terms of the available technology, the future is now!

1. Lewis J. Perelman, *School's Out* (New York: Avon Books, 1993), 102.

2. George Gilder, "Breaking the Box." *National Review* (August 15, 1994), 38.

3. Plato, *Dialogues of Plato*, ed., Robert M. Hutchins, 54 Vols. *Great Books of the Western World* (Chicago: Encyclopedia Britannica, 1952), 333.

4. Charles Darwin in Francis Darwin ed., *The Life and Letters of Charles Darwin* (New York: E. Appleton, 1986), 81-82.

5. Samuel Taylor Coleridge, *Biographia Literaria* (New York: Dutton, 1965), 169.

6. Athanasios Moulakis, *Beyond Utility: Liberal Education For a Technological Age* (Columbia, Mo.: University of Missouri Press, 1994), 106-107.

7. Qtd. in Michael Heim, "The Computer as Component: Heidegger and McLuhan," *Philosophy and Literature* 16 (1992), 312.

8. Moulakis, 104.

9. Howard Gardner, *Multiple Intelligences: The Theory in Practice* (New York: BasicBooks, 1993), 8.

10. Gardner, 7.

11. Qtd. in Betty Wallace and William Graves, *Poisoned Apple* (New York: St. Martin's Press, 1995), 40.

12. George Gilder, *MicroTimes*, No. 125, (July 25, 1994), 300.

13. Qtd. in David A. Kaplan and Adam Rogers, "The Silicon Classroom," *Newsweek* (April 22, 1996), 60.

14. Gardner, 7.

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